Application No. 10/658,973

Filed: September 10, 2003

TC Art Unit: 2826 Confirmation No.: 3986

AMENDMENTS TO THE SPECIFICATION

Please amend the four paragraphs that begin on page 5, line 15 as follows:

Fig. 1 is a transverse section showing an embodiment of the present invention and Fig. 2 is its perspective view. Fig. 3 is a partial cross-sectional view showing a glass-sealed light-emitting diode of the present invention implemented on a printed circuit board. As shown in Fig. 1, the glass-sealed light-emitting diode comprises an LED bare chip 1 having opposite surfaces, which are provided with electrodes 2 for supplying power from external. A pair of dumet wires 3 are each connected to the respective electrodes 2 sandwiching the LED bare chip 1 therebetween. A glass seal 4 is employed to seal the LED bare chip 1, the electrodes 2 and parts of the dumet wires 3 integrally. A pair of metallic disc plates 6, having holes 5 formed through the center, are secured on both sides of the glass seal 4, allowing the pair of dumet wires 3 to project - projected from the glass seal 4, -to passing through the holes 5. These plates 6 have solder-plated outer sides and circumferential surfaces. The pair of dumet wires 3 are cut in such a manner that they can not project beyond the metallic plates 6 after passing through the holes 5 of the metallic plates 6.

In an exemplary method of producing the above-described glass-sealed light-emitting diode 10, the LED bare chip 1 having opposite surfaces provided with the electrodes 2 is sandwiched between the pair of <u>dumet</u> <u>jumet</u> wires 3 via the electrodes 2. The LED bare chip 1 is then secured in a hole 7 formed through the center of the glass seal 4.

.

Application No. 10/658,973 Filed: September 10, 2003

TC Art Unit: 2826

Confirmation No.: 3986

The glass seal 4 is then heated and melted to fill gaps located between the glass seal 4, the LED bare chip 1 and the dumet _jumet_wires 3 to contact the glass seal 4 directly with the LED bare chip 1 and form an interface 8—therebetween. Thereafter, the glass seal 4 is cooled to complete the glass-sealed LED bare chip 1. In this case, when the glass seal 4 contracts at the time of cooling, the _dumet __jumet_wires 3, which contacts the electrodes 2 on the LED bare chip 1, suffer stresses toward the LED bare chip 1. As a result, the electrodes 2 on the LED bare chip 1 and the _dumet _jumet_wires 3 have firm contact and reliable continuity therebetween.

After the glass seal 4 is cooled, the metallic plates 6 having the holes 5 formed in the center are fixedly secured on both sides of the glass seal 4. In this case, the pair of <u>dumet the jumet</u> wires 3 projecting from both sides of the glass seal 4 are allowed to pass through the holes 5 in the metallic plates 6. Then, the <u>dumet</u> wires 3 are cut off so as not to project beyond the metallic plates 6.

Finally, solder plating 9 is applied to surfaces of the metallic plates 6 disposed at the both sides of the glass seal 4 and to the ends cut-off-portions of the dumet wires 3-except for surfaces adjacent to the ends of glass seal 4 to complete the glass-sealed light-emitting diode 10.

Please amend the paragraph that begins on page 8, line 5 as follows:

As described above, in the glass-sealed light-emitting diode of the present invention, the LED bare chip is hermetically glass-sealed. Therefore, in comparison with the resin-sealed light-

Application No. 10/658,973 Filed: September 10, 2003

TC Art Unit: 2826

Confirmation No.: 3986

emitting diode, external moisture, which negatively - worst influences on—the durability of the LED bare chip, can be intensively—prevented from penetrating so as to retain high reliability over a long time period long-term use. In addition, glass having a larger refractive index compared to air, is in directly contact with the emission surface of the LED bare chip. Accordingly, even when a-light emitted from the active region of the LED bare chip arrives at the emission surface of the LED bare chip at a relatively larger critical angle, it can be output into the glass. Thus, a light-emitting diode with a high external quantum efficiency can be achieved. Further, the glass-sealed light-emitting diode of the present invention is surface-mountable on the printed circuit board. Accordingly, it can be implemented integrally (i.e. mounted) with other surface mounting components. Thus, a single-sided printed-circuit board can be employed to reduce the cost of the printed circuit board and the processes of mounting components can be simplified to reduce the assembly cost, resulting in a-reduced production cost of a final product that incorporates components mounted thereon the components-mounted board therein. If the light-emitting diode is shaped in a polygonal column, when it is positioned on the printed circuit board for mounting thereon, it can not be displaced easily, even if -though-the printed circuit board vibrates. - more or less, and thus, the light-emitting diode can be mounted on an intended location reliably. These are many excellent effects achievable by the present invention.